

Roman Empire 14

Social group	Number of members	People	Percentage of population	Average family income (in HS)	Average per capita income (in HS)	Income in terms of per capita mean
Senators 1/ Knights (equestrian order) 1/ Municipal senators (decurions) 1/ Other rich people Legion commanders 2/ Centurions Praetorians 3/ Ordinary soldiers 4/ Workers at average wage 5/ Tradesmen and service workers 6/ Farmers and farm workers (free or slave) 7/ Memo: Subsistence minimum 8/	600 40000 360000 200000 50 2500 9000 250000 1066667 133333 1200000 0	2470 158000 1422000 790000 198 9875 35550 987500 4213333 526667 4740000 0	0.004 0.285 2.562 1.423 0.000 0.018 0.064 1.8 7.6 0.9 85.4	150000 30000 8000 4810 67670 16160 3000 1010 800 468 234 180	37975 7595 2025 12.7 17132 4091 759 256 304 468 234 180	100 20 5.3 12.7 45.1 10.8 2.0 0.7 0.8 1.2 0.6 0.47
<i>Total</i>		<i>55,500,000</i>	<i>100.0</i>		<i>380</i>	<i>1.0</i>

Note: The average household size of 3.95 (derived from Goldsmith, 1984) used throughout except for senators where the average household size (on account of many dependents) was increased to 4.1. HS = sestertius.

For explanation of the notes, see text below.

Income distribution data: The basis for calculations is provided by Goldsmith's (1984, pp. 276-278) estimates. Goldsmith provides minimum wealth (census qualification) for the three top classes (senators, knights and municipal senators), an estimate of their mean incomes, and an estimate of their population sizes. The problem was that -taking these estimates as given, and assuming that the bulk of the working population lived at slightly above the subsistence minimum (\$PPP 300)—one finds an overall lower mean income than given by Goldsmith and used here (HS 380). This is why we introduced, following Goldsmith who spoke of that class but did not put any numbers on it, a fourth rich class of “other rich people” who were neither Roman knights nor municipal senators (both of which needed to fulfill the census requirements). There is little doubt that that “fourth” rich class existed but putting a number on its size and average income is obviously difficult. We decided to take as their mean income the average of the two other higher classes’ incomes (leaving out as decidedly the richest the class of Roman senators).¹

There is a lively argument on how “graduated” was economic class structure of the Empire and whether one can speak of an *economic* middle class (a position we implicitly take here). In a recent contribution, Scheidel (2006, p.54) argues: “I conclude that there is sufficient evidence in support of the notion of an economic continuum from a narrow elite to a steadily broadening middle class as we move down the resource ladder...It is perfectly possible to reconcile the dominance of a disproportionately affluent elite with the presence of a substantial middle class”. Note finally that if one takes the position in favor of the existence of a middle class, then -to be consistent—the estimates of average income in early Empire must be reasonably high in order for such a class to exist at a level significantly above the subsistence. Temin’s estimates of Roman income (discussed below) would not allow that.²

The total number of *honestiores* (the top three classes with families) was, according to Goldstein, about 2.8 percent of the population. Scheidel (2007, p. 41-42) however believes that they numbered just over 1 percent. The difference revolves around the number of municipal senators, assumed to number 360,000 by Goldstein. In order for Scheidel 1 percent to hold, their numbers should be around one-third of it. But it is very difficult to see how that can be

¹ Maddison (2008, pp. 48-9), noticing the same discrepancy, reduced the total number of municipal senators (*decurions*) from 360,000 to 240,000.

² Scheidel (2006) does not seem to realize this fully in his proposed calculations of social structure.

reconciled with Jongman (1988), approvingly quoted by Scheidel (2006, p. 42, n. 6) who estimates that Italy alone had at least 90,000 city councillors.

Notes to the table above

1/ From Goldsmith (1984, pp. 276-278). Total amount for senators includes HS15 million of Augustus' and Imperial household's (100 people) private fortune. The censuses, according to Goldsmith, were 1 million for senators and 250,000 for the knights. According to Finlay (p. 46), the census for the knights was 400,000 HS. The average annual income of senators' class is calculated to be 15 percent of the census (note: census is the *threshold*) and for knights, 12 percent of the census amount. The average income of municipal senators is from Goldsmith (p. 278) and represents an average of census requirements and estimated average income of municipal senators in diverse (from large and rich, to small and poor) cities.

2/ The legion's commander wage ratio (67 times ordinary soldier's wage) is given in Duncan-Jones (p. 116) who quotes Brunt (1950). The number of legion commanders calculated by dividing 250,000 soldiers by the average size of a legion (5,000 men; for the average size of the legion, see Duncan-Jones p. 215 and Tacitus, *Histories*, Penguin Classics, pp. 226 and 322).

3/ Clark (p. 676). The size of the Praetorian guard was 9 cohorts each with 1,000 men.

4/ Calculated from Clark (p. 676): 225 denarii (1 denarius = 4 HS) plus 50 modii of wheat valued at 110 HS (Milanovic, 2006, Table 3). This assumes the average wheat price 2.2 HS per modius. Harl (p. 276) gives modius wheat price range from 8 asses (2 HS) in Egypt to 32 (8 HS) in Rome. Temin (2006, p. 138) gives free market price in Rome at 4-6 HS. After the huge Rome's fire in 64, Tacitus (Book XV, Chapter 39) mentions that the price of wheat in Rome, due to the sudden impoverishment of the population, dropped to 3HS per modius. We select a relatively low price to avoid inflating incomes by using Roman prices for the goods that were essentially consumed outside the capital.

Tacitus (Book I, Chapter 17) quotes soldiers (in year 14) complaining that a soldier is worth only 10 asses per day. That would be 2.5 HS per day or 912 HS per annum, some 10 percent below our estimate of HS 1010. Tacitus' number almost certainly refers to the monetary pay only, *i.e.*, it excludes payments in kind.

Size of the army (250,000) from Temin (2006, p. 147) quoting Goodman (1997). Similarly, Walbank (p.19) gives 250-300,000.

5/ Based on Goldsmith (3.5 HS per day times 225 working days). Temin (2006, p. 138) gives also the average wage in Rome as 3-4 HS per day (see also Milanovic, 2006, Table 4 and the sources given there). Wages expressed at Rome-city prices (see discussion of mean income below). Workers are estimated to account for 80 percent of the urban population.

6/ From Temin (2006, p. 136). We assume that their income was twice the subsistence. They are assumed to account for 10 percent of the urban population.

7/ The lowest class according to Temin (2006). It includes both free laborers and slaves. We assume their average income to be 30% above the subsistence minimum. They account for more than 90 percent of the rural population (which in turn accounts for 90 percent of the total population). According to Evans (1981), quoted in Geraghty (2007, p. 1041), an average plebeian family of 4 produced grain worth about 1000 HS. That would give a per capita income of 250 HS from grain alone. They are likely to have had other sources of income, pushing their income somewhat higher. Farm workers (slave or free) had about the same income although slaves appear to have worked harder than free workers (250 vs. 150 days per annum on average; see Geraghty, 2007, p. 1040, fn. 21; based on Spurr, 1986).

Maddison (2008, pp. 47-50) distinguishes between free and slave labor using Scheidel's (1997) estimates for both the number of slaves and their annual number of workdays. For workers at average wage, he takes Goldsmith's estimate (as we do here too). For slaves, he assumes that their average income was 300 HS per annum and that they had only 0.25 dependents per person. This works out as 240 HS per capita, very close to our estimate of 234 HS.

The bottom line is that we have 93 percent of the population (workers, and farmers and farm workers) living on household income less than HS 800 (equal to the average wage) while that number reaches almost 97 percent in Maddison (2008). The difference is due to Maddison's disregard of the army in his calculations.

8/ From Milanovic (2006, Table 4), based on Goldsmith (1984, p. 268) and the amount of *alimenta* paid from the public treasury to boys under 15 years of age. Duncan-Jones (1982) gives a slightly different amount (16HS per month) for boys, and 10 HS per months for girls (quoted from Geraghty (2007, p. 1046, fn. 52)).

Discussion.

(1) Slaves and landowners. Slaves are not shown as a separate social category. This is because their economic conditions covered practically the entire spectrum of incomes (with a possible exception of the very top). Their consumption levels varied widely: they ranged from being very rich (owning slaves themselves) to being very poor (mostly slaves engaged in mining). Even rural slaves, who were on average worse-off than urban slaves, were not just “all undifferentiated gang laborers; [on the contrary] there are lists of rural slave jobs that are as varied as the known range of urban or household slave jobs” (Temin, no date, p. 8). For the urban slaves, who were more numerous than rural slaves,³ the prevalence of manumission made Roman slavery (unlike that in the Americas) an “open slavery”. Schiavone (2000) and Temin (no date) discuss the position of slaves and the role of manumission at great length. Similarly, landowners are not shown separately as a class since most landowners belonged to the four top classes and their incomes from land are included in our totals.

(2) Top of the income distribution. The estimated Gini of between 37 and 40 might seem low in light of the excesses of wealth in Rome (see Table below with data gathered from Tacitus’s *Annals*) But this extraordinary wealth was limited to a very few people at the very top. It is very unlikely that they would be even selected (so few they were) to participate in a modern random household survey. Moreover, their extraordinary wealth was not out of step with what we observe today. For example, the fabulously rich triumvir Marcus Crassus (-115 to -53) whose wealth was estimated at 200 million HS (Schiavone, 2000, p.71) and hence his income at HS 12 million per year,⁴ has more than a counterpart in today’s Bill Gates and other super rich. Crassus’s income was equal to about 32,000 mean Roman incomes. Using today’s US GDI per capita, the equivalent would be an income of about \$1 billion per year. But this is an income that is easily made by many of today’s hyper-billionaires and yet the overall inequality is not much affected by it. Bill Gates’s fortune is estimated at \$50 billion which with 6% interest yields \$3 billion per year, i.e., three times as much as Crassus. According to The *Forbes’ Magazine* 2007 list of richest people in the world,⁵ four individuals in the United States have wealth above \$20 billion, which would place them around Crassus’s level.

³ According to Schiavone (2000, p.112), slaves represented 35 percent or more of Italy’s population. And Italy was the most urbanized part of the Empire.

⁴ Using the conventional interest rate of 6 percent (see Finley, 1985, p.104).

⁵ Available at http://www.forbes.com/lists/2007/10/07billionaires_The-Worlds-Billionaires-North-America_6Rank.html.

Other incomes and wages compiled from Tacitus' *Annals* and *Histories* (for comparison and illustrative purposes):

	Amounts in HS	Amounts in terms of the estimated average annual income (or GDP)	Source
<i>From Annals</i>			
Augustus' donative to each pretorian guardsman (year 14)	1000	2.6	Book I, Chapter 8
Augustus' donative to each legionnaire and soldier of cohorts (year 14)	300	0.8	Book I, Chapter 8
Augustus' donative to people (year 14)	43.5 million	0.2% of GDP	Book I, Chapter 8
Tiberius dowry to Agrippa's daughter (year 19)	1 million	~2600	Book II, Chapter 86
Left by the Senate to Senator Marcus Piso after his punishment (year 20)	5 million	~13,000 (or 5 times the senatorial census)	Book III, Chapter 17
Tiberius' personal loan to the banks (who were suffering from shortage of funds; year 33)	100 million	0.5% of GDP	Book VI, Chapter 25
Tiberius' donative after a large fire in Rome (year 36)	100 million	0.5% of GDP	Book VI, Chapter 51
Maximal lawyer's fee (year 47)	10,000	26	Book XI, Chapter 7
Consular reward for raising a pertinent issue in the senate (paid to a senator; year 52)	5 million	5 times the senatorial census	Book XII, Chapter 53
Nero's guaranteed annual income for Messala (year 58)	500,000	~1300	Book XIII, Chapter 34
Seneca's average annual earnings (years 55-58)	75,000	~200	Book XIII, Chapter 42
Nero's average annual gift to the state treasury (year 61)	60 million	~0.3% of GDP	Book XV, Chapter 18
Nero's subsidy to each soldier after they crushed Piso's conspiracy (year 65)	2,000	5.2	Book XV, Chapter 72
Nero's gift to Lyon (Lugdunum) after a big fire	4 million	~0.02% of GDP	Book XVI, Chapter 13

(year 65)			
From <i>Histories</i> (year 69)			
Nero's total largesse (donatives during his rule, 54-68)	2.2 billion	~10% of GDP	Book I, 20
Tip to each member of a cohort whenever Galba (the emperor) dined	100	0.26	Book I, 24
General's bounty to each soldier	300	0.8	Book I, 66
Emperor's gift to troops after a seeming revolt	5,000	~13	Book I, 82
Vitellius (the short-lived emperor squanders money on banquets and debauch in a few months)	900 million	~4% of GDP	Book II, 95
A social climber's spoils during Nero's rule	7 million		Book IV, 42
State loan floated for public subscription in 69	60 million	~0.3% of GDP	Book IV, 47

Note: Augustus's donatives refer to the amounts given out at his death.

Inflation rate was estimated by Temin (2003, p. 149) to have been less than 1 percent per annum, up to the end of the Julio-Claudian era in 69. Thus, later (post-Augustan) incomes ought to be deflated accordingly.

(3) Top-to-bottom spread. Following Jongman (1988), Geraghty (2007, p. 1051) writes: "Indeed, the average senator generated 200 times more income than a peasant's subsistence wages in the early Imperium". Our numbers show this ratio to be 210.

Population and area: Population is taken from Goldsmith (1984: p. 263). Goldsmith also gives the area as 3.3 million km², while Taagepera (1979: Table 2, p. 125) gives 3.4 million km² (for year 1, wrongly labeled as year 0).

Urbanization rate: Goldsmith's (1984: pp. 272-3) range is 9 to 13 percent with the former number "nearer the lower boundary at the beginning of the principate." (The urbanization rate seems to have been calculated based on the cut-off point of 2-3,000 people). In addition to Rome, the population of which is conventionally estimated at 1 million (Bairoch 1985: p. 115), there were six cities (Carthage, Alexandria, Antioch, Ephesus, Pergamum and Apamea) with the populations in excess of 100,000 (Schiavone 2000: p. 61). Taking their average size to be 150,000, it follows that about 2 million (or almost 4 percent of the population) lived in the cities that were larger than 100,000. For the urbanization rate, we use a median estimate of 10 percent. For Augustan Italy, the richest and most urbanized region of the Empire, the urbanization rate is estimated at about 27 percent

(1.2 million urban residents out of a population of 4.4 million (see Geraghty (2007, p. 1044, fn. 39, and p. 1048) and the references given there).⁶

Mean income in \$PPP: Obtained by expressing mean income from Goldsmith (HS 380) in terms of the subsistence minimum (estimated at HS 180), and then pricing the latter at \$PPP 300. This yields mean income of \$PPP 633 in 1990 prices. In his most recent “Contours of the World Economy, 1-2003 AD” (2008; Chapter 1) Maddison gives disposable per capita income for the Empire in year 14 as \$PPP 570. His approach in deriving this average is rather peculiar: it is obtained as an average of Roman incomes expressed in gold and wheat compared with 1688 purchasing power of English incomes in terms of wheat and gold (Maddison, 2008, p. 52).

Discussion

Temin (2003) argues that Goldsmith’s calculation of the mean Roman income is too high. However, there are at least three counterarguments to Temin: (1) his critique of Goldsmith’s calculations is not based on Goldsmith’s methodology (which Temin praises) but on Goldsmith’s apparent use of Rome-based wage rates for the rest of the Empire including Egypt where both wheat prices and wages were much lower in nominal terms. Temin then uses an average of the two nominal wage-rates, and obtains a significantly lower overall Imperial mean income. But that issue can be sidestepped by arguing that the Imperial numbers are expressed in Rome-city prices. This is acceptable since Temin (2003, p. 19) himself believes that *real* (wheat) wages in Egypt and Rome-city were about the same. Thus, Temin’s methodology of averaging two nominal wage-rates seems faulty. (2) The level of infrastructural development, urbanization, size of a large standing army (almost ½ of a percent of total population), and the point made by Schiavone (2000) that regional differences in mean incomes might have been as high as 5 or even 6 to 1,⁷ imply that an overall Imperial mean income was unlikely to have been less than HS 380 (as calculated by Goldsmith) which, using the assumptions regarding the subsistence minimum, translates into about \$PPP 633 (in 1990 prices). (3) There is the consistency argument against changing Goldsmith’s mean income while retaining all his other calculations.

⁶ And, as today, the richest part was in the North: “...the forces of Vitellius now controlled the most prosperous area of Italy, including all the flat country and the cities between Po and the Alps” (Tacitus, *Histories*, Book II, Chapter 17).

⁷ If there are large inter-regional differences, and even the poorest region is at the subsistence, then the overall Imperial mean must be relatively high. Large regional differences are mentioned by Goldsmith too (1984: p. 265).

REFERENCES

Allen, Robert C. (2001), "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War," *Explorations in Economic History*, vol. 38, pp. 411-447. An earlier version "Wages, Prices & Living Standards: The World-Historical Perspective" available at www.economics.ox.ac.uk/Members/robert.allen/WagesPrices.htm

Allen, Robert C. (2003), "Progress and poverty in early modern Europe", *Economic History Review*, LVI, pp. 403-443.

Bairoch, Paul (1985), *De Jéricho à Mexico: villes et économies dans l'histoire*, Paris: Arcades, Gallimard.

Brunt, P. A., (1950), "Pay and superannuation in the Roman army," *Papers of the British School in Rome*, 18: 50-71.

Clark, Colin (1957), *The Conditions of Economic Progress*, London: MacMillan.

Collier, Paul and Anke Hoeffler (2004). "Greed and Grievance in Civil War," *Oxford Economic Papers* 56, 4: 563-595.

Duncan-Jones, Richard (2000), *Structure and Scale in the Roman Economy*, Cambridge: Cambridge University Press.

Finley, Moses (1985), *The Ancient Economy* (second edition), Penguin.

Geraghty, Ryan (2007), "The impact of globalization on the Roman Empire, 200BC - AD 100," *The Journal of Economic History*, 67, 4 (December): 1036-1061.

Goldsmith, Raymond W. (1984), "An Estimate of the Size and Structure of the National Product of the Early Roman Empire," *Review of Income and Wealth*, 30, 3 (September): 263-88.

Goodman, Martin (1997), *The Roman World, 44 BC - 180 AD*, London: Routledge.

Harl, Kenneth H. (1996), *Coinage in the Roman Economy, 300 B.C. to A.D. 700*, Baltimore and London: Johns Hopkins University Press.

Jongman, Willem (1988), *The Economy and Society of Pompeii*, Amsterdam: J.C. Gieben.

Maddison, Angus (2007), ["World Population, GDP and Per Capita GDP, 1-2003 AD"](http://www.ggdc.net/maddison/), Updated March 2007. Available at <http://www.ggdc.net/maddison/>.

Maddison, Angus (2008), *Contours of the World Economy, 1-2003 AD*, Oxford: Oxford University Press.

Milanovic, Branko (2006), "An estimate of average income and inequality in Byzantium around year 1000," *Review of Income and Wealth* 52 (3).

Scheidel, Walter (1997), "Quantifying the source of slaves in the Early Roman Empire", *Journal of Roman Studies*, 87: 157-69.

Scheidel, Walter (2006), "Stratification, deprivation and quality of

life" in Margaret Atkins and Robin Osborne (eds.), *Poverty in the Roman World*, Cambridge: Cambridge University Press.

Schiavone, Aldo (2000), *The end of the past: Ancient Rome and the modern West*, Cambridge Mass.: Harvard University Press.

Spurr, M.S. (1986), *Arable cultivation in Roman Italy c. 200 BC - c. AD 100*, London: Society for the Promotion of Roman Studies.

Taagepera, Rein (1979), "Size and duration of empires: growth-decline curves, 600BC - 600AD," *Social Science History*, 3, 3/4.

Temin, Peter (2006), "The economy of the early Roman Empire," *Journal of Economic Perspectives*, 20, 1 (Winter): 133-51.

Temin, Peter (2003), "Estimating GDP in the Early Roman Empire," paper presented at the conference on "Innovazione tecnica e progresso economico nel mondo romano" organized by Elio Lo Casio (April 13-16 2003).

Temin, Peter (no date), "The labor supply of the early Roman empire", mimeo.

Walbank, F. W. (1946), *The decline of the Roman Empire in the West*, London: Cobbett Press.